cervical vertebræ of the Macrauchenia, and the almost flattened form of their anterior and posterior articular surfaces, I infer that the long neck in this singular quadruped must have been carried in the same stiff and upright position as in the Vicugna and Guanaco.

The following individual differences are observable in the two cervical vertebræ of the Macrauchenia;—in the posterior one the superior arch is wider and with thicker parietes, the body is more concave below, and the inferior transverse processes have a more lengthened origin.

Not a fragment of dorsal vertebræ, ribs or sternum, is included in the collection of the bones of the Macrauchenia; but fortunately seven lumbar vertebræ, forming a consecutive series of the same individual as that to which the cervical vertebræ belonged, were obtained, all more or less fractured, but all sufficiently perfect to demonstrate their true nature. These vertebræ, although not possessing such distinctive characters as the cervical, contribute by no means an unimportant element towards the illustration of the osteology of the Macrauchenia, and support the view which I have taken of its affinities; for, although, as will be seen from the structure of its extremities, this animal must be referred to the Order Pachydermata, yet no existing species of that order has more than six lumbar vertebræ; whilst among the Ruminants it is only in the Camel, Dromedary, Llama and Vicugna, that the lumbar vertebræ reach the number seven,—the same number which characterizes the extinct annectant species in question. The dimensions of the vertebræ in the Macrauchenia present the same relations to the two cervical vertebræ above described, which the lumbar vertebræ of the Vicugna bear to the third, fourth, or fifth of its cervical vertebræ. But here we begin to discover modifications of form, in which the Macrauchenia deviates from the Camelidæ, and approaches the Pachyderms, as the Horse and Hippopotamus; and these indications become stronger as the vertebræ approach the sacrum.

In the Camel, as well as in the Horse and Hippopotamus, the bodies of the lumbar vertebræ diminish in vertical extent, or become flatter, as they approach the sacrum; but this character is more strongly marked in the Macrauchenia than in either of the above species. But in the Camelidæ the transverse processes of the lumbar vertebræ, are elongated, flattened, and narrow, resembling ribs, except that they are nearly straight; and this is more particularly the case with the transverse processes of the last lumbar vertebræ, which are the narrowest of all in proportion to their length, and stand freely out without touching the sacrum. The transverse processes of the lumbar vertebræ of the Giraffe resemble those of the Camel, but are relatively smaller and shorter. In the Hippopotamus the transverse processes of the lumbar vertebræ are much broader in proportion to their length than in any of the Ruminants, and they increase in breadth to the

last lumbar vertebra, which presents in addition, the following characters; each transverse process sends off from its posterior margin a thickened and transversely elongated protuberance, which supports a flattened articular surface adapted to a corresponding surface on the anterior part of the transverse process of the first sacral vertebra: it likewise presents on its anterior edge a flattened and rough surface, which is closely attached by ligamentous substance to the opposite part of the transverse process of the penultimate lumbar vertebra. A similar structure exists in the last two lumbar vertebræ of the Rhinoceros, Tapir, and Horse. In the latter animal, anchylosis of these articulating surfaces of the lumbar and sacral vertebræ generally takes place with age, and, judging from the character of the same surfaces in the Hippopotamus, the motion of its lumbar vertebræ upon the sacrum may in like manner become ultimately arrested.

Now in the Macrauchenia, as in the Pachyderms above cited, the transverse processes of the last lumbar vertebræ are of considerable thickness and extent, and are joined by enarthrosis to the transverse processes of the sacrum; but the bony structure of these joints would indicate that they were not subject to be obliterated by anchylosis. The articular surfaces which project from the posterior part of the transverse processes of the last lumbar vertebræ present a regular and smooth concavity, adapted to a corresponding convexity in the transverse processes of the first sacral vertebra. These articulating surfaces have evidently been covered with smooth cartilage; they present a pretty regular transverse ellipsoid form. A view of the three joints by which, independently of the two oblique processes, the last lumbar vertebra of the Macrauchenia was articulated with the sacrum, is given in Plate VIII. fig. 1. The transverse processes of the posterior lumbar vertebra, besides their agreement with those of the Horse and Hippopotamus in the structure just described, also correspond with them in general form, and deviate remarkably from those of the *Camelidæ* in their great breadth.

It will be seen that the articulations on the body and transverse processes of the last lumbar vertebra of the Macrauchenia differ from the corresponding articular surfaces of the Horse, inasmuch as the middle surface is convex, while the two lateral ones are concave, and these are moreover relatively larger than either in the Horse or Hippopotamus: by this structure the trunk was more firmly locked to that segment of the vertebral column, which receives and transmits to the rest of the body the motive impetus derived from the hinder extremities, which are in all quadrupeds the chief powers in progression; while at the same time the shock must have been diminished by the great extent of interposed elastic cartilages; and a certain yielding or sliding motion would be allowed between the lumbar vertebræ and sacrum.

The anterior oblique processes of the lumbar vertebræ of the Macrauchenia